

Stevens (A. H.)

A

CLINICAL LECTURE

ON THE

PRIMARY TREATMENT OF INJURIES,

DELIVERED AT

THE NEW-YORK HOSPITAL,

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BY

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Obedient Servant,

ALEX. H. STEVENS.

Chambers-st., Nov., 1837.

ON THE NATURE AND TREATMENT

OF THE

PRIMARY EFFECTS OF INJURIES.

THE nature and treatment of the often fatal symptoms which ensue immediately after severe injuries, are not at all, or very slightly, adverted to, in those systematic treatises on Surgery, which have fallen under my observation. The subject is slightly touched upon by Boyer in his chapter on injuries of the head, and is glanced at by Sir A. Cooper and Mr. Abernethy. The practice of the first of these great masters is unquestionably wrong: the pathology of the two last not defensible. Mr. Travers, in his work on Irritation, has favoured the public with some very profound, but not always very lucid observations, upon the manner in which the primary symptoms are induced. The French writers in general, including Roche and Sanson in their great work on Pathology,* do

* *Nouveaux Elemens de Pathologie Medico-Chirurgicale*. This valuable work is now in the course of translation by Dr. Doane, whose character is a guaranty for its excellence.

little more than speak of them, as referable to the state of the nervous system. With all that is said by these writers, and by Rust, Richter, Langenbeck, and Chelius, and in the periodical literature of the day, there is yet wanting a simple and practical account of the nature and treatment of the primary symptoms of severe injuries.

I find the attempt to elucidate this subject difficult, because it is so intimately connected with physiology and general pathology as to be wholly unintelligible without putting forth a sort of creed on some points regarding the nature of life, health, and disease. The following propositions are submitted as preliminaries :

1st. That the phenomena of life are ultimately dependent upon the impression made by blood on the nervous system.

2d. That health being the easy and exact performance of the various functions, and disease its converse, this latter may be induced by agents :

First. Which render the circulation of the blood deficient or excessive in any part of the body. Example. The effect of cold upon the surface of the body, driving the blood from the surface, is

sometimes to destroy the balance, and produce accumulations in the internal organs,—congestions first occur, the stasis of blood afterwards induces inflammation.

Second. Which impair, increase, diminish, or pervert the natural susceptibility of the nervous system or any part of it, to the action of the blood upon it. Example. Injury of the spine causes paralysis of the lower limbs. Although the nerves are in this case supplied with a due quantity of blood, and that of good quality, their functions are not performed.

Third. Which vitiate the blood itself. The third head embraces diseases arising from a poison circulating in the blood or other fluids, as in dissection—wounds, syphilis, exanthematous, miasmatic, and typhoid fevers, scurvy, scrofula, and cachectic diseases.

But it must be understood, that in all cases of disease, from injury or other cause, neither a loss of the balance of the circulation, of the healthy state of a portion of the nervous system, or a vitiated condition of the blood, can exist separately and alone. Every inflammatory fever is the extension of disease from a part to a whole of the

circulating system. Inflammation has its seat in the blood-vessels ; yet very soon, if not primarily, it affects also the nerves of the part, and to a greater or less degree, remote parts of the nervous system. Every painful symptom in phlegmasial disease, is an illustration of this proposition. Among the thousand examples that might be offered to your consideration, I will notice only the pain at the end of the penis, attending inflamed bladder, in the boy who has been sent here by Dr. Field, for me to operate on for stone ; and the lad in No. 11., who tells you of the pain in his knee, when you know the malady to be inflammation of the hip-joint.

The action of the heart is sometimes instantly arrested by acute pain, even in a distant part, or to speak more scientifically, by severe irritation of the sentient extremities of a remote nerve,—even from the small nerves going to the great toe, as I have witnessed in an operation upon a lady for inverted toe-nail.

GENERAL DESCRIPTION.

The following category includes the more common descriptions of injuries that occur in practice, and which form the subject of these remarks.

Severe wounds, contusions, fractures, injuries of the head, hemorrhages, burns, and strong mental emotions.

The symptoms induced by these injuries may be thus enumerated, — loss of sense and sensation, syncope, delirium, coma, convulsions, jactitation; small, rapid, slow, or irregular pulse; rigour, paleness and coldness of the surface; irregular or stertorous respiration; vomiting, retching, or nausea; great thirst; suppression of urine.

It may surprise some of the younger part of my audience to find *mental emotions* enumerated among the causes of severe injuries. But the longer I live the more fully am I convinced that a medical man imperfectly understands his profession who does not appreciate the influence of the mind in all accidents and diseases.

A patient whom I visited, in consultation with my friend Dr. S. Moore, a gentleman of excellent constitution, and in middle life, was recovering from an attack of the smallpox. For several days he had been well enough to leave his house, and attend to his business an hour or two every day, and was sitting in his chair and chatting with his family, when he heard his child fall down

stairs. She was taken up in a condition which led him to think her seriously injured, though it proved otherwise. He became pale and trembling, went to bed, had a severe chill, became comatose during the night, and did not get about for a month; during which time we almost despaired of his recovery. Coma and other alarming symptoms continued for many days; loss of memory and mental imbecility during several weeks.

ETIOLOGY.

In the explanation of these symptoms, although the minor details may be obscure and uncertain, it is capable of demonstration, that the shock is transmitted from the nerves of the injured part continuously to one or more of the great nervous centres, the spinal marrow, the head, or the nerves of the ganglionic system. The impression is readily transmitted from one of these centres to the other; but rarely is it reflected back again. Tetanus, however, affords an instance of the reflected action of an injury.

A medical man fell from his horse and struck upon the nates. He was at first insensible; after a while he was able to crawl to a fence by the road-side, and felt as if pins were run into all parts

of his body. His arms and feet became paralyzed partially. A few days after the accident palpitations of his heart, inability to pass his water, indigestion and severe head-ache supervened; with these symptoms he came to town for my advice, one year after the injury. This is an example of irritation propagated to various parts of the system, and continuing for a long time. The consequence of injury of the spine is usually confined to the nerves below the seat of injury; but here it extended from the lower part of the spinal marrow upward, and thence to the nerves of the arms; some part of the shock passing off laterally to the nerves of the viscera. The eyes sympathize with each other because their nerves have a common origin.

Taking the case of the crushed leg now under treatment: we explain the coma, loss of sense, sensation and voluntary motion, the stupefaction and delirium, by the transmission of the shock to the brain; the nausea, retching and vomiting, by the transmission of it directly or indirectly to the stomach; the convulsions and jactitation to the concussion of the brain reflected back through the spinal nerves; the condition of the pulse and of the surface of the body, by the state of the heart; which the shock may be supposed to reach

through its ganglionic connexions with the spine, or from the brain, through the eighth pair of nerves. The excessive thirst and suppression of the secretions are more complicated results, the precise etiology of which is not so capable of explanation. As suppression of the secretions follows, rather than precedes the more marked symptoms of severe injuries, I cannot agree with my revered master, Sir Astley Cooper, in considering it as the cause of these symptoms. Although the treatment of many diseases is based upon the restoration of the secretions, — this only proves, that not being able to reach the first cause, we can merely palliate what in reality are effects. Thus in exanthematous and other fevers, and in all the “self-limited” diseases, so well described by my distinguished friend, Professor Bigelow, we do not cure the malady, although we may prevent its fatal tendencies, — the physician does not propel the boat, but keeps it from the rocks and quicksands in its course.

Delirium, coma, and insensibility, are caused either by the shock transmitted to the brain, or by the want of a due impulse of blood from the heart, during the weakened condition of that organ. The same effects result from apparently opposite, but in reality, similar conditions; all agreeing in

this point, that the blood does not freely circulate in the brain. Weakened or oppressed circulation, the pressure of a clot, or broken bone, in depression of the skull, alike imply a want of circulation in some part or in the whole of that organ. This condition of the brain from whichever of these causes it may have been induced, transmits to the heart and stomach the same shock : thus we have retching and vomiting in apoplexy from congestion or extravasation of blood in the head ; and the same symptoms in depressed skull, the same in crushed limb, the same after excessive bleeding, or an extensive burn.

As respects the **PROGNOSIS**, an experienced eye will form it rather from the general aspect of the case than from any particular symptom. The countenance of the patient is undoubtedly the index by which practical men are most governed. A fallen jaw and half closed eyelid, with irregular rattling respiration and coma, indicate approaching dissolution. Intelligence enough to answer simple questions respecting his physical condition, indicates a more moderate injury ; and if the head be the chief seat of the injury, forms the ground of very favourable prognosis. Long continued coldness without rigour or returning heat, and continuing in despite of remedies, leaves little room

for hope: the same may be said of long continued retching.

On the other hand, while rigour and vomiting show that the injury has been severe, they indicate a hopeful degree of reaction, and are usually succeeded by more favourable symptoms, viz: a quiet condition of the stomach, a return of warmth, and a fuller pulse.

Excessive pain continuing for many hours, although not so alarming a symptom as delirium, insensibility or convulsions, is often the precursor of one or more of these conditions. It occurs more commonly as a consequence of injuries of the surface of the body, or of the extremities, than of those affecting directly the head or viscera.

TREATMENT.

Many lives are lost by improper management immediately after severe injuries, and especially by bleeding when the skin is cold, and the pulse small. This is often done in compliance with popular prejudice, and against the opinion of the practitioner; yet some medical men entertain the opinion that under any, and all circumstances, bleeding after an injury, if not useful, is at least a

harmless practice. Bleeding after all injuries was the practice I adopted in the early part of my professional career, having followed in this particular the advice of Boyer, as given in his Chapter on Injuries of the head.

“What we have chiefly to fear after a violent percussion of the head are, sanguineous congestion, rupture of vessels, extravasation of blood, and inflammation. The most powerful means of preventing these consequences is to diminish the quantity of blood by bleeding. At the moment, therefore, when we are called to a person who has fallen or received a blow upon his head, and who has symptoms of concussion, we should bleed largely from the arm, and repeat the operation several times within twenty-four hours. If the symptoms are not relieved, a vein in the foot, or even the jugular vein should be opened. At the same time leeches should be applied to the temples. It is impossible to say how much blood should be taken away in such a case. Few cases require so large and repeated bleedings as injuries of the head. Experience has shown that bleeding is the most efficacious remedy that can be employed, and the writings of the best observers abound with cases illustrating its advantages. All writers are not however agreed as to the propriety of bleed-

ing in the cases in question. Some looking only to the loss of the elasticity of the brain, and the stupor resulting from it, consider bleeding injurious, and prefer the use of remedies calculated to relieve the brain from its torpid state. But experience has shown that when the injury has not been severe enough to destroy entirely the functions of the brain, and to cause sudden death, there is no further danger except from extravasation of blood, inflammation and suppuration. Now bleeding is the best remedy to prevent these consequences. The number of bleedings, the quantity to be drawn, and the part from which it is to be taken, must be determined by the ability of the patient to bear them, his strength and temperament."

In the same chapter, Boyer says, emetics are sometimes useful but generally dangerous remedies. He advises purgatives, "warm drinks, even cordials, when the stupor continues and the weakness is very great."

"The difficulty of treating these cases properly, arises from the uncertainty of the diagnosis. In simple stupor of the brain, exciting remedies are indicated; in extravasation they are injurious. The indications are clear when the nature of the

case can be ascertained — the obscurity is in the symptoms by which the condition of the brain is manifested.” — *Boyer Traite des Maladies Chirurgicales*. Vol. 4th.

I have seen many recoveries from a state of extreme prostration where either nothing was done except leaving the patient quiet, or where rest was combined with stimulating remedies; and having carefully compared the result of this treatment with that of an opposite character, I confidently recommend it to you in all cases of injury attended with great prostration except internal hemorrhages; as in the head from apoplexy or injury, and in any of the cavities of the chest or abdomen from wounds. In these cases it is better to incur the dangers of extreme depression of the powers of life, while a clot is forming at the mouths of the bleeding vessels, than to re-excite the bleeding by giving force to the action of the heart and arteries. These remarks are especially applicable to gunshot wounds of the lungs.

A man was brought into the hospital in the year 1820, who had been very severely injured in various ways by the explosion of a steam boiler. I was in the ward visiting other patients when he arrived. He was insensible, pulseless, his extre-

mities cold, his respiration slow, irregular and stertorous. By the stimulating treatment he recovered, and ultimately got well, though nearly blind, and much mutilated.

A child of Prof. D., aged ten months, fell upon the floor from a height of four or five feet: I saw it about one hour after the injury, during which time it had continued cold, insensible, and vomiting; and on entering the room, witnessed the termination of its second venesection. It died in two or three hours, having never rallied, or had heat of skin. No appreciable injury of the head was found. I cannot doubt that under proper treatment it might have escaped at least the first dangers of the injury.

This subject is brought to our consideration by the case of *Sheyne*, upon whom a bank of earth had fallen, burying him beneath, and fracturing his leg. He was bled as soon as he was taken out; put into a cart, and brought to the hospital, a distance of seven miles. When he arrived, the house surgeon, Dr. Baker, wrote to me, saying, "a man has been brought in with fracture of the leg, and insensible, although there is no apparent injury of the head." This man in the evening, when I saw him, lay as if asleep; when aroused he appeared

astounded and unable to collect his ideas; able to speak, but not knowing what to say. Now this condition of the mind did not arise from any direct injury of the brain, but from the transmission of shock from the injured extremity to that organ. The head partook of the general torpor of the whole nervous system. The course of the shock I suppose to have been from the nerves of the leg the spinal marrow, and thence to the head. Some part of the shock extending to the ganglionic system through its direct connexions with the spinal marrow, and some reflected back from the head.

The injury of the leg proved to be so severe that amputation seemed clearly indicated. The leg was enormously swollen; no pulsation could be felt in either of the tibial arteries: the foot was perfectly cold, and of a pale livid colour. Would he have borne the operation while he was insensible and cold, with a small rapid pulse? Undoubtedly not. This would have been adding another shock to the nervous system which it could not have sustained. He was stimulated with ammonia and camphor, and arrow-root with brandy, (for he was a hard drinker.) On the following day, reaction having taken place, his pulse having become stronger, his skin warm, his intellects

brighter, and his foot remaining cold, although thickly covered with cotton, he was thought to be in a condition to require and to sustain the operation. But flattering himself that his improvement would go on, he was persuaded not to submit to it. On the third day mortification took place — the vesications were pricked with a needle, and the cuticle suffered to remain. Balsam of Peru was smeared over the leg, and a yeast poultice was applied. The stimulants being continued, sulphate of quinine was substituted for carbonate of ammonia, and camphor, and an opiate at night. On the eighth day a line of demarkation formed, and he submitted to amputation of the thigh, high up, but not altogether beyond the reach of the injury. The operation was quickly done, and very little blood was lost, for which I have to thank my colleagues who assisted me, especially those very skilful surgeons, Drs. Cheesman and J. Kearny Rodgers.

TREATMENT IN GENERAL.

If the patient is at all sensible, the surgeon by his manner and language should *cheer and encourage him*. The nervous symptoms are intimately connected with the state of the mind, sometimes almost exclusively dependant upon it. *Absolute rest* is of the utmost importance. In all cases

where the powers of life are low, from whatsoever cause, after severe injuries, every unnecessary movement of the patient should be avoided.

It is better that a person who has suffered a severe injury, should be left at or near the spot where the accident has happened until he has revived, and until suitable means can be procured for conveying him to an hospital, or to his house, with the least possible disturbance.

The powers of life greatly depressed by the injury, may be sunk beyond the possibility of recovery, by rough and protracted transportation, in carts or wagons, or even carriages or litters, which last are by far the least injurious. When the patient has reached his quarters, his life will often depend upon the celerity and address with which his clothes are removed, his body transferred to his bed, and the necessary surgical manipulations performed. In extreme cases nothing should be done for show; even the washing away of blood may be deferred. A fracture should be loosely put up; a luxation left unreduced, until you are sure the system will rally.*

* No unnecessary delay should take place in the reduction of a dislocation. I once knew a dislocation of the femur upon the dorsum of the Ilium, reduced by the extension of only one man, and very quickly; the patient being in state of great prostration from a recent injury.

A gentleman, whom I visited in conjunction with the father of my friend, Dr. Hosack of this city, had an attack of apoplexy not threatening immediate dissolution : he died while he was being carried to a bed in an adjoining room.

TREATMENT OF PARTICULAR SYMPTOMS.

When the system is suffering *acute pain*, after an injury, a condition which excludes direct injuries of the brain, and the more violent shocks to the nervous system, opium is the remedy ; it is best given in a liquid form, and very moderately diluted. There is a charm in this remedy in assuaging pain, which no other possesses.

The *trembling and coldness*, are to be treated by the application of warmth to the epigastrium and extremities. Bottles or bladders filled with hot water, heated bricks and hot salt are convenient means of applying heat. Friction with hot flannels, or with a warm hand, should be made on the extremities ; and the patient, if he can swallow, should take laudanum, or ammonia, or spirits, and warm drinks. If the patient cannot swallow, or if his stomach does not retain what it receives —

two ounces of warm water with half as much brandy should be injected into the rectum. A full dose of laudanum should be added to the injection, unless there is a direct injury of the head. If the injection be retained, it may be repeated at the expiration of one hour, if required; but care should be taken to move the patient as little as possible during the administration of remedies.

It is often difficult to decide upon the ability of the patient to swallow; the timidity of nurses not unfrequently leaves the sick to die for want of stimulus, when in fact they are able to swallow. The surgeon placing himself at the patient's right side, should gently elevate the head with the left hand, and rubbing a half-filled spoon against the lower lip of the patient, endeavour to arouse him by a decided exhortation to swallow. At the first indication of consciousness he should pour the liquid on the back part of the tongue, and wait a few moments to see if it is swallowed; which he will know by seeing the larynx to be slightly elevated. If this does not take place, these efforts should be repeated. If these attempts do not succeed, the liquid should be permitted to run out of the mouth, otherwise it may produce strangulation.

TREATMENT OF PARTICULAR SYMPTOMS.

Nausea and vomiting, when they do not arise from direct injury of the brain, are most effectually relieved by an appropriate stimulus in small bulk, and a sinapism to the pit of the stomach. This condition is sometimes induced by excess in the strength of the doses, or of the quantity of fluid administered. The stomach should never be teased, when it constantly rejects what is poured into it: after an hours rest it will often recover its tone, and retain very small quantities of ingesta. If nausea is an original and not a sympathetic affection, we should look to its cause: if it arise from the state of the brain, we should treat according to the condition of that organ; and in all these cases stimulate or deplete, as the case may require, according to this explanation of its nature.

In the treatment of *delirium*, likewise, we are to stimulate or deplete, according to its cause; so in *coma*; so in *convulsions*. Opium is rarely admissible in *coma*; never where there is direct injury of the head. Excessive pain, either violent and transient, or more moderate, and of longer continuance, may induce convulsions or *coma*. Pain of long continuance not unfrequently causes

convulsions, and afterwards coma; commonly, however, coma comes on without previous convulsions. In the treatment of convulsions thus threatened or induced, the liquid preparations of opium are chiefly to be relied on. The doses must be large, and repeated, according to the exigency of the case, until the pain is subdued. Counter-irritants to the epigastrium and feet, are indicated in coma; to convulsions arising from pain, they are not applicable.

Jactitation consists in the irregular tossing of the limbs with no definite purpose. It is to be distinguished from hemiplegiac movements, and from attempts to rise in bed, resulting from delirium, and accompanied with a hot skin and a bright eye. *Jactitation* occurs in various degrees as a symptom of fever of this kind; there are two forms: *First*, the fever with strong, full pulse, moderately accelerated. *Second*, with a very rapid thrilling pulse, easily compressed. Bleeding is applicable to the former state; the latter demands the application of cold to the head, tepid ablutions to the extremities, opium and extreme quiet of mind and body. But the sort of *jactitation* more immediately under consideration, occurs in connexion with coldness of the surface, a lustreless eye, and disturbed sensorium; this is a common

effect of hemorrhage. Warm stimulants, external heat, sinapisms to the epigastrium, together with mechanical confinement in a draft of cool air, and frequent spunging of the face with cold water, are here indicated. When the skin has become hot, spunging with cold water, or spirits and water, or ice to the head is also useful. In many instances, confinement by bandages, pressure upon the knees so as to keep the legs extended, and at rest, will induce sleep; even the weight of a pillow in slight cases is attended with benefit. Of the internal remedies more particularly indicated by this symptom, opium and camphor stand in the foremost rank.

The *thirst*, which so often leads to those piteous calls for water, on the battle-field, in the cock-pit, and in the accident-wards of hospitals, *should not be fully indulged*; but the mouth should be wet with spoonfuls of water at short intervals. In addition to this, the surface may be spunged over with tepid spirits and water, or the face alone, if the skin is cold. As soon as the skin becomes warm and begins to be moist in the flexures of the joints, the clothes should be lightened; when profuse sweating takes place the surface should be dried with napkins, and all the drinks should be taken cold.

If an injury has been received soon after a full meal, and *vomiting* does not take place spontaneously, it may be advantageous to excite it by a feather pressed into the throat, or a dose of sulphate of zinc or ipecacuanha, provided the retching is incessant, and there is no injury of the head, or other circumstances to render the use of such a remedy inadvisable.

Sometimes vomiting or retching occurs *in those habituated to spiritous liquors*, from withholding the accustomed stimulus : here the customary dram is required. In all cases where it continues after the stomach is emptied, it should be met by sinapisms to the epigastrium, or to the whole abdomen, applied hot, and not so strong as not to be tolerated for two or three hours. If the surgeon be not attentive and rigid in the enforcement of the proper administration of remedies, vomiting will be reinduced by an undue quantity of stimulants, or of the vehicles in which they are administered. On this point it is difficult to fix upon doses and quantities that will not require great variation in particular cases. Yet as a medium dose that can be administered in any case, I would state about two quarts in twenty-four hours : and of brandy half a pint; carbonate of ammonia one dram; the vehicle two quarts. As regards the intervals of exhibiting these

remedies, once in fifteen minutes is sufficiently often for the worst period, and the quantity half an ounce. After the patient has rallied, he will be more benefited by giving larger quantities at longer intervals, and permitting him to sleep. Alternations of nourishment and sleep, are nature's best restoratives. If you have a very careful and intelligent assistant at the bedside, the patient may be suffered to sleep until the pulse begins to flag; but after injuries, as in low fevers, patients may sleep away their strength, and relapse into coma and prostration, for want of due stimulation. The timidity of nurses not unfrequently leaves patients to sink for want of stimulus, when in fact they are able to swallow. The surgeon placing himself at the patient's right side, should gently elevate his head with the left hand, and rubbing the half-filled spoon against the lower lip of the patient, endeavour to arouse him by a decided exhortation to swallow; and at the first indication of consciousness he should pour the liquid on the back part of the tongue, and wait a few moments to see if it is swallowed, which he will know by seeing the larynx to be slightly elevated. If this does not take place, these efforts should be repeated, and the patient be again exhorted to swallow. If the attempt does not succeed, the liquid should be

permitted to run out of the mouth, otherwise it may produce strangulation.

Stimulants should not be given in excess. It is well known that when a limb has been exposed to cold for a length of time, (as the hands of boys playing with snowballs,) after the heat begins to return the part becomes swollen and preternaturally hot—first to the sensation, and afterwards to the thermometer. This is one of the simplest examples that can be adduced, of excessive reaction, as it is termed. Some have supposed it to arise from the sudden expansion, by heat, of the blood contained in the minute vessels. But more probably the explanation given by Dr. John Brown is the correct one: that the excitability of the part accumulates during the abstraction of heat, and becomes excessive when the stimulus of heat is reapplied. Precisely analogous to the condition of the half-frozen hand, is the state of the nervous and vascular systems, after their actions have been depressed by an injury or a hemorrhage. Now the boy's hand is restored to its healthy condition, after having been long exposed to frost, by a very cautious and gradual application of local stimulants. Even the temperature of the atmosphere is too high in many cases, and the part requires to be plunged into cold, or even iced water, to allay

the excessive reaction. So when the actions of the nervous or vascular system, or both, have been very much reduced, after reaction has been once excited by stimulants, the utmost care must be taken lest it become *excessive*. During the continued coldness, give stimulants of a diffusible kind; ammonia, hot mint tea, or even spirits: by the mouth if possible—if not, by the rectum; as the heat returns give cold drinks, and apply cold to the temples or head.

In general, it is not well to give stimulants long after a rigor has set in.

When a person has been travelling with the thermometer at zero, and approaches the bar-room fire, he shakes and trembles, and feels cold, although he may have been comfortable on the road. The rigor is the harbinger of returning warmth. If he sits by a hot fire and takes stimulants, brandy in lieu of warm tea, a feverish condition of the system is induced. It is in this way that colds are taken. Therefore, be careful, lest the operation of the stimulants be carried into the state of excitement, and cause undue rapidity of circulation, and undue determinations of blood to particular organs. The serous tissues of the head, the mucous membranes of the alimentary canal,

and of the lungs, are most often the seat of such local determinations.

Another bad effect of giving too much stimulus is, that vomiting is excited. "Ah, doctor," said a shrewd bye-stander, when a medical man attempted to bleed, and the blood would not flow, "nature knows more than the physician." So she does, also, when she rejects by vomiting, the excessive doses to which the stomach is often subjected.

A third evil consequence of excessive stimulation is, that it exhausts the excitability and leaves the patient in a state of depression very difficult to manage. To stop with the stimulants is difficult; to go on with them impossible. The giving of powerful stimulants, is like borrowing money at high interest; it may do in a special emergency, but if long continued, it is sure to be followed by loss of excitability, which is the capital by which life is supported.

Unloading the bowels, in the early periods of disease, is like shortening sail and clearing the deck of a ship before a gale. It is a preparation for the worst; but it must not be attempted when the patient may be prostrated by the movement which it requires and implies. The presence of fœcal matter, and undigested aliment, is the minor evil

at first, and should be submitted to, but not in general beyond twenty-four hours after the injury.

Promoting the secretions of the liver by calomel, in connexion with the unloading of the bowels, is an object of much importance. Calomel, moreover, can be borne on the stomach when oil or the infusion of senna or salts would be rejected, but its operation is invariably slow. Whatever purgative is selected, or whether we depend upon a stimulating injection, as of aloes or infusion of senna, if the patient is not so low that night and day are alike to him, it will be right not to let the operation of medicines upon the bowels take place during the usual hours of sleep. The proper mode of managing the state of *reaction*, where the skin is heated and the pulse rapid, is to unload the bowels, and to give slight fluid nourishment of the farinaceous kind, water, lemonade, or bread water, and to keep the head cool, and the body and mind as quiet as possible.

As surgical operations and especially amputations after injuries, involve a loss of blood, and give a shock to the nervous system, it becomes in connexion with this subject, an important subject of inquiry, under what circumstances they may or may not be performed.

As a general rule, the shock of the operation should not follow that of the injury before the system has had time to rally. We should wait for returning warmth of the surface, and a fuller beat of the pulse, but we should not wait until the injured part becomes inflamed, and high fever is excited. In some cases, we may be on the spot, and separate a crushed limb before the nervous system has fully sympathized with the injury. But this period has usually passed before the surgeon arrives; before the lapse of twenty-four hours, and after the system has reacted, is the proper moment. If the limb has become inflamed, we must wait until suppuration abates the inflammation. If it mortifies, in general we should wait until the line of demarcation is formed; and longer while the patient is mending. Food should not be taken immediately before an operation or directly after it; for the power of digestion being arrested, it oppresses the stomach, and undergoes chemical changes. After a patient is put upon the table, no time should be lost in beginning the operation. As respects the patient's mind, the operation is commenced from the moment he witnesses the preparations for it. I have often seen the countenance lighten up after the first incision. Engaged in amputating the thigh of a lady, some months since, after the skin had been divided, her face

brightened up, and she said "go on, do not fear for me; *I feel better than I did before the operation was begun.*" I trust, gentlemen, you will distinguish between the coolness and self-possession which every surgeon should possess, and that heartless manifestation of indifference, which allows him to think of the figure he himself is making, at a time when all the energies of his mind should be exclusively directed to the welfare of his patient.

